BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of

Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996	)	GN Docket No. 04-54

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TABLE OF CONTENTS

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Comcast Corporation ("Comcast") hereby responds to the above-captioned Notice of Inquiry ("Notice") concerning the deployment of advanced telecommunications capability.[1] The Notice was issued pursuant to the legislative mandate, in Section 706(b) of the Telecommunications Act of 1996, that the Commission determine, from time to time, "whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion."[2] The answer is unquestionably "yes."

Today, broadband services are widely available throughout much of the nation.[3] High-speed services are rapidly being deployed, particularly by cable and telephone companies but

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1 *In re Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, Notice of Inquiry, 119 FCC Rcd. 5136 (2004) ("*Notice*").

2 *See* § 706(b) of the Telecommunications Act of 1996, Pub. L. 104-104, 110 Stat. 56 (1996) (codified in the notes under 47 U.S.C. § 157) ("1996 Act" or "Telecommunications Act").

3 For convenience, this discussion generally uses the terms "advanced telecommunications capability," "broadband," and "high-speed" interchangeably. (In other contexts, "broadband" is sometimes used to describe the updated cable plant and the full suite of services it can deliver, including hundreds of digital channels, video-on-demand ("VOD"), high-definition television ("HDTV"), IP phone services, and so on.) As with the Commission's past use of these terms, *see Notice* ¶ 11, all of the services discussed here have capabilities of at least 200 kilobits per second ("kbps") in one direction -- and generally more, often much more. As the Commission has recognized, advanced telecommunications technology is an "evolving

also, increasingly, by wireline carriers, wireless providers, satellite companies, and unlicensed operators. Thanks to private sector initiative and private sector capital, and welcome restraint on the part of the Commission and most other regulatory authorities, the marketplace is working its magic and consumers are reaping the benefits.

These comments focus first on Comcast's success in delivering the broadband services it promised at the time of its acquisition of AT&T Broadband. We then discuss the significant and growing competition among providers of broadband services. We close with some observations about the importance of market forces -- and the limited role of government -- in driving the deployment and use of broadband services.

I. COMCAST HAS DELIVERED ON ITS PROMISE TO ACCELERATE THE DEPLOYMENT OF BROADBAND TECHNOLOGIES.

The principal public interest benefit that Comcast described to the Commission as likely to result from its acquisition of AT&T Broadband was that it would "accelerate the deployment of facilities-based high-speed Internet service, digital video, and other broadband services, particularly to residential customers."[4] After careful review, the Commission determined that "the proposed transaction is likely to have a positive impact on deployment of broadband services."[5] And so events have proved.

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concept" whose meaning will change over time. Just as 2400 bps modems were a huge improvement over 300 bps modems, and 56 kbps modems were an improvement over 9600 bps modems, so too the transmission rates regarded as "high-speed" today may from some vantage point in the future seem anachronistic and slow.

4 *In re Applications for Consent to the Transfer of Control of Licenses from Comcast Corporation and AT&T Corp., Transferors, to AT&T Comcast Corporation, Transferee,* Applications and Public Interest Statement, MB Docket No. 02-70, at 29-35 (Feb. 28, 2002).

5 *In re Applications for Consent to the Transfer of Control of Licenses from Comcast Corporation and AT&T Corp., Transferors, to AT&T Comcast Corporation, Transferee*, Memorandum Opinion and Order, 17 FCC Rcd. 23246, ¶ 182 (2002) ("*Comcast-AT&T Order*").

In seeking to meet the wishes of consumers, especially in the face of aggressive and ever-growing multichannel video competition, Comcast has made enormous investments in system upgrades and rebuilds, service quality, customer service, new technology, innovation, and advanced services. Since passage of the Telecommunications Act, over $39 billion has been invested in Comcast's cable systems (including those acquired from AT&T Broadband). In 2003 alone, we spent approximately $4.1 billion on capital improvements, primarily in the territories previously served by AT&T Broadband, with approximately $1.4 billion dedicated to upgrading cable systems and approximately $1.6 billion dedicated to upgrading customer premises equipment.[6] We constructed a record 53,000 miles of fiber last year, significantly exceeding our already aggressive plans for 46,000 miles,[7] and rebuilt another 8,700 miles with fiber in the first quarter of 2004. We have met or exceeded every upgrade target that we established, and we ended the first quarter of 2004 with 96% of our cable plant upgraded.[8]

All of this investment (using private risk capital) and effort has paid off. Of the 40 million homes that Comcast passes, over 36.1 million households currently have access to Comcast's high-speed Internet service.[9] Over 5.6 million of those households subscribe to the

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6 *See* Press Release, Comcast Corp., *Comcast Full Year and Fourth Quarter Results Meet or Exceed All Operating and Financial Targets Setting Stage for Continued Growth In 2004*, at 10 (Feb. 11, 2004), *available at* http://media.corporate-r.net/media_files/irol/11/118591/Earnings_4Q/4q03a.pdf ("*Comcast YE03 Earnings Release*").

7 *Comcast YE03 Earnings Release* at 3.

8 *See* Press Release, Comcast Corp., *Comcast Reports First Quarter 2004 Results* 2 (Apr. 28, 2004), *available at* http://www.cmcsa.com/phoenix.zhtml?c=118591&p=irol-newsArticle&t=Regular&id=520136 ("*Comcast 1Q04 Earnings Release*"). Comcast's investment has resulted in 93% of AT&T Broadband's systems being upgraded at the end of 2003, compared to only 73% at the end of 2002 (shortly after Comcast acquired the systems).

9 *Comcast 1Q04 Earnings Release* at 9, Table 5.

service,[10] making Comcast the nation's largest provider of high-speed Internet. Demand continues to grow; in the first quarter of 2004, we added an additional 394,000 high-speed Internet customers, and we expect to have at least 6.7 million by year-end.[11]

Beyond the innate appeal of high-speed transmission capability, this growth has been further stimulated by improvements in the service and expanded marketing efforts. Significantly, Comcast announced in October 2003 that it would double downstream speeds to 3 Mbps at no additional cost.[12] Comcast also expanded the retail availability of the service,[13] and has undertaken initiatives to further broadband deployment and adoption.[14] Furthermore, Comcast substantially improved the content and functionality of its web portal, Comcast.net. Comcast's high-speed cable Internet service has always included some bundled content, but the volume and quality of that content has recently been greatly enhanced. In fact, just last month

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10 *See id.*

11 *See id.* at 2. These upgrades have also produced numerous other consumer benefits. The quality of the basic cable service has improved, as shown by reduced churn and a reversal in subscriber erosion; Comcast gained 117,000 customers in the former AT&T Broadband systems in 2003, compared to AT&T Broadband's loss of over 483,000 customers in those same systems a year earlier. *See Comcast YE03 Earnings Release* at 3. VOD service is now available to over 11 million of Comcast's cable customers and, by the end of 2004, Comcast expects that number to grow to 19 million. *See Comcast 1Q04 Earnings Release* at 1-2. HDTV service is now available to nearly 19 million of our customers (representing 91% of our basic cable customers). *See id.* at 2. Digital video recorder ("DVR") capabilities are now offered in 14 Comcast markets and are expected to be available across Comcast's entire footprint by year-end 2004. *See id.*

12 *See* Press Release, Comcast Corp., *Comcast to Double Downstream Speeds for Comcast High-Speed Internet Customers* (Oct. 2, 2003), *available at* http://www.cmcsk.com/phoenix.zhtml?c=147565&p=irol-newsArticle&t=Regular&id=454829&.

13 *See, e.g.,* Press Release, Comcast Corp., *Comcast and Office Depot Expand Retail Availability of Comcast High-Speed Internet, Comcast's Broadband Internet Service Now Available in More than 330 Office Depot Locations* (Oct. 28, 2003), *available at* http://www.cmcsk.com/phoenix.zhtml?c=147565&p=irol-newsArticle&t=Regular&id=463620&; Press Release, Comcast Corp., *Comcast and Staples Announce Retail Alliance Featuring Comcast High-Speed Internet in More than 400 Outlets* (Nov. 11, 2003), *available at* http://www.cmcsk.com/phoenix.zhtml?c=147565&p=irol-newsArticle&t=Regular&id=468735&.

14 Some of Comcast's and the cable industry's efforts to increase broadband deployment and adoption through educational initiatives are described in the appendix.

Comcast's redesigned web portal won a Gold Medal Award from the Society of Publication Designers.[15] Elements of Comcast.net that particularly caught the attention of the judges include:

- "The Fan" -- Comcast's broadband multimedia player that dynamically features content from a variety of leading providers. Combining ease of use and a completely unique interface, The Fan is designed to deliver on-demand video like no other Internet application available today. Within 30 days of its November 2003 launch, The Fan increased Comcast.net's video usage by a factor of 10. This innovative application also boasts average viewing durations for short-form entertainment videos (5 minutes or under) that are 2.5 times the averages on competing sites.

- "The Assistant" -- a toolbar designed to provide always-on utilities and super-easy drag-and-drop personalization. The Assistant's innovative design also features a detachable function that enables users to bring this broadband Internet tool anyplace on their computer. As a result, users can enjoy quick, constant, and immediate connections to the information that is most important to them, including local weather from The Weather Channel, sports information and scores, Super Search with Google, stock watch lists, horoscopes, favorite sites, and top movies (including a feature that allows searches for local show times by ZIP code).

- "The Cover" -- Comcast's interactive guide to the hottest content on broadband each day. The Cover features rich graphics, a photo slide show of the day's news, attention-grabbing headlines, and direct links to top stories and trends. Whereas dial-up was all about reading the news from a series of text links, The Cover delivers the news in pictures, video clips, and text, neatly organized for one-click viewing.

Of course, Comcast's high-speed Internet customers are by no means limited to the content available at Comcast's portal. They are free to use their connectivity to access any lawful content on the Internet, play X-Box, watch streaming video, download music, make VOIP calls, and so on.

As the foregoing demonstrates, Comcast's willingness to put its capital at risk has paid off, and its success in meeting its merger promises has resulted in significant benefits to

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[15] Press Release, Comcast Corp., *Comcast.net Brings Home the Gold in Global Design Competition - The 39th Annual Society of Publication Designers Awards* (Apr. 7, 2004), *available at* http://www.cmcsk.com/phoenix.zhtml?c=147565&p=irol-newsArticle&t=Regular&id=512550&.

consumers. The upgrade of the cable systems acquired from AT&T Broadband has made new technologies and services available to millions of additional households nationwide. Over 36.1 million households in Comcast's service areas are now both broadband- and digital cable-ready, which means that a consumer need only make a single phone call to obtain video and high-speed Internet services. Consumers are responding enthusiastically to the availability of these services: demand is strong, and significant opportunities for growth remain.[16]

II. BROADBAND COMPETITION CONTINUES TO GROW.

Despite the high quality and exceptional value offered by high-speed cable Internet service, neither Comcast nor any other cable company can afford to rest on its laurels. Although cable took the initiative to make high-speed Internet an affordable alternative for consumers, other delivery mechanisms have been and are being developed and deployed. The most successful of these to date is Digital Subscriber Line ("DSL") technology, which now has over nine million customers and is highly competitive with cable Internet service. In addition, third-generation mobile wireless services are being deployed. And a number of other significant potential competitors -- from Wi-Max to broadband over power lines to Ka-band satellites -- are also beginning to emerge. All of this investment and innovation is being spurred by the strong and favorable consumer response to the introduction of broadband services.[17]

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[16] In areas not served by Comcast, other cable companies are aggressively deploying and marketing high-speed cable Internet. Comments filed in this docket by the National Cable & Telecommunications Association will provide an industry-wide perspective.

[17] *See* White House, *A New Generation of American Innovation* 12 (Apr. 2004) ("Consumers are adopting broadband faster than they have adopted other technologies such as color televisions, wireless phones, VCRs, and personal computers."), *available at* http://www.whitehouse.gov/infocus/technology/economic_policy200404/innovation.pdf.

A. DSL

As the Commission has recognized, telephone companies had DSL technology long before the emergence of high-speed cable Internet service but chose to withhold it from the market.[18] Once impelled to do so by competition from cable Internet service, the telcos hastened to invest over a period of several years to make DSL available to approximately 75 million households,[19] with the availability footprint still expanding.[20] Demand for this service has been strong, and with recent price cuts it has been increasing.[21] First-quarter reports from the four largest telephone companies reflect a substantial increase in orders, leading to record totals of subscribership.

Specifically, SBC reported a record 446,000 new DSL customers in the past quarter and now counts nearly 4 million DSL lines in service -- up 60% in a single year;[22] Verizon boasts a

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18 *See* Cable Services Bureau, FCC, *Broadband Today: A Staff Report to William E. Kennard, Chairman, FCC* 27 (Oct. 1999), *available at* http://www.fcc.gov/Bureaus/Cable/Reports/broadbandtoday.pdf.

19 *See* Letter from L. Barbee Ponder IV, Senior Regulatory Counsel-D.C., BellSouth Corporation, to Marlene Dortch, Secretary, FCC, CC Docket No. 02-33, at 2 (July 29, 2003) (citing data from Lehman Brothers).

20 The Bell company with the smallest percentage of DSL availability, Qwest Communications, plans to expand its DSL coverage area from 45% at the end of 2003 to more than 60% of total access lines by the end of 2004. *See* Press Release, Qwest Communications Int'l Inc., *Qwest Communications Reports Fourth Quarter Net Loss Per Diluted Share of $0.17; Full Year 2003 Earnings Per Diluted Share of $0.93*, at 3 (Feb. 19, 2004), *available at* http://www.qwest.com/about/media/pressroom/1,1720,1449_archive,00.html. Verizon expanded DSL availability to 18 million homes in 2003 and expects to add another 7 million in 2004. *See* Press Release, Verizon Communications Inc., *Verizon to Expand DSL Offerings with New, Higher-Speed Service and Voice-Over-IP Package* (May 4, 2004), *available at* http://investor.verizon.com/news/VZ/2004-05-04_X82766.html.

21 *See* Justin Hyde, *Phone Companies Gain Ground in Speedy Web Access*, Reuters.com (May 4, 2004) ("[F]or the first time, U.S. local telephone companies have sold more high-speed Internet connections than cable providers . . . . [P]hone companies now see broadband as essential to their survival, committing billions of dollars to extend their networks, market their services and offer extras like free wireless home networking gear.").

22 *See* Press Release, SBC Communications Inc., *SBC Communications Reports First-Quarter Diluted Earnings of $0.59 Per Share; Achieves Best-Ever DSL Net Adds, Continued Fast Ramp Up in Long Distance, Significant Margin Improvement* 8 (Apr. 21, 2004), *available at* http://www.sbc.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=21145 ("*SBC 1Q04 Earnings Release*").

"company-record 345,000 net additions" for the first quarter, for a total of nearly 2.7 million lines;[23] BellSouth added 156,000 DSL customers, for a total of 1.6 million;[24] and Qwest added 107,000 DSL subscribers, for a total of 744,000.[25] Prospects for continued growth of this service presumably are strengthened by the expansion of DSL offerings to new service areas, the demonstrated willingness of these telephone companies to cut DSL prices to gain market share, the introduction of improved DSL transmission speeds,[26] and the implementation of joint marketing arrangements between these telephone companies and the two leading providers of Direct Broadcast Satellite services.[27]

Note, too, that these numbers do not account for those competitive local exchange carriers ("CLECs") that are providing DSL services over the local loops built and maintained by

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[23] *See* Press Release, Verizon Communications, Inc., *Verizon Reports First-Quarter Revenue Growth of 3.9%, Including Industry-Leading Wireless Revenue Growth of $1.1 Billion* 1 (Apr. 27, 2004), *available at* http://newscenter.verizon.com/ ("*Verizon 1Q04 Earnings Release*").

[24] *See* Press Release, BellSouth Corp., *BellSouth Reports First Quarter Earnings* 1-2 (Apr. 22, 2004), *available at* http://www.bellsouth.com/investor/pdf/1q04p_news.pdf ("*BellSouth 1Q04 Earnings Release*").

[25] *See* Press Release, Qwest Communications Int'l Inc., *Qwest Communications Reports First Quarter 2004 Net Loss Per Diluted Share of $0.17; Record Customer Growth in DSL and Long Distance* 2 (May 4, 2004), *available at* http://www.qwest.com/about/media/pressroom/1,1720,1519_archive,00.html ("*Qwest 1Q04 Earnings Release*").

[26] SBC has launched a new DSL service that offers speeds of 1.5 to 3 Mbps downstream, and 384 kbps upstream, to meet consumers' increasing bandwidth needs. *See SBC 1Q04 Earnings Release* at 8. Verizon is following suit. *See* Verizon, *supra* note 20.

[27] *See, e.g.,* Press Release, EchoStar Communications Corp., *Qwest Forges Agreement with EchoStar to Offer Satellite Services as Part of Communications Bundle* (July 21, 2003), *available at* http://www.corporate-ir.net/ireye/ir_site.zhtml?ticker=dish&script=410&layout=-6&item_id=433371; Press Release, EchoStar Communications Corp., *SBC Communications, EchoStar Forge Strategic Partnership, Will Offer 'SBC Dish Network' Television Service* (July 21, 2003), *available at* http://www.corporate-ir.net/ireye/ir_site.zhtml?ticker=dish&script=410&layout=-6&item_id=433365; Press Release, BellSouth Corp., *BellSouth and DIRECTV Announce Agreement to Sell Digital Satellite Television Service as Part of BellSouth Answers Bundle* (Aug. 27, 2003), *available at* http://bellsouthcorp.com/proactive/newsroom/release.vtml?id=43807; Press Release, Qwest Communications Int'l Inc., *Qwest Forges Agreement with DIRECTV To Offer Satellite Services as Part of Communications Bundle* (July 21, 2003), *available at* http://www.qwest.com/about/media/pressroom/1,1720,1304_archive,00.html.

the incumbent local exchange carriers ("ILECs") either via "line-sharing" or "line-splitting."[28] Statistics as to the total number of CLEC DSL customers are not available, but the service seems to be expanding.[29]

B. Licensed Wireless Services

The evolution of wireless services from analog cellular to digital Personal Communications Service ("PCS") to a new "third generation" ("3G") of services creates the potential for a vast expansion of high-speed services. Verizon Wireless recently touted its third-generation Evolution Data Optimized ("EV-DO") network as "the nation's first wide-area broadband wireless network from a major carrier."[30] Verizon Wireless has announced multi-million dollar agreements with Lucent Technologies and Nortel Networks to provide the wireless infrastructure for this technology over the next two years and committed to expanding its BroadbandAccess service to cover one-third of its network by the end of this year (it is already operational in Washington, D.C. and San Diego, California) and every metropolitan area in the

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[28] "Line sharing" is when a CLEC provides DSL service over the same line that the ILEC uses to provide voice service to a particular end user, with the ILEC using the low frequency portion of the loop and the competing carrier using the high frequency portion. "Line splitting," by contrast, involves one CLEC providing narrowband voice service over the low frequency of a loop and a second CLEC providing DSL service over the high frequency portion of that same loop. *See In re Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, Deployment of Wireline Services Offering Advance Communications Capability*, Report & Order and Order on Remand and Further Notice of Proposed Rulemaking, 18 FCC Rcd. 16978, ¶¶ 251, 255 (2003). An additional way in which a CLEC can provide DSL without constructing its own local transmission is to purchase "naked DSL" on a wholesale basis. Only Qwest currently offers this service. *See Qwest to Offer DSL Without Voice, National Mobile*, Forbes.com (Feb. 25, 2004), *available at* http://www.forbes.com/markets/newswire/2004/02/25/rtr1274740.html.

[29] At year-end 2003, Covad announced that it had 517,000 digital subscriber lines. *See* Press Release, Covad Communications Group, Inc., *Covad Communications Group Announces Fourth Quarter 2003 Results* (Feb. 18, 2004), *available at* http://www.covad.com/companyinfo/pressroom/pr_2004/021804_news.shtml. Through an expanding partnership, Covad and AT&T offer a combined DSL and CLEC voice service in 25 states. *See* Press Release, Covad Communications Group, Inc., *Covad Partners with AT&T to Offer Bundled DSL and Voice Services in 11 New States; Aggressive Nationwide Rollout of Voice and Broadband Bundle Continues To Build Momentum* (Apr. 6, 2004), *available at* http://www.covad.com/companyinfo/pressroom/pr_2004/040604_news.shtml.

[30] *Verizon 1Q04 Earnings Release* at 5.

Nation by year-end 2005.[31] Though advertised as offering average downstream speeds of 300-500 kbps, the service can achieve peak speeds of 2 Mbps.[32]

Other licensed wireless carriers are also beginning to offer broadband wireless services. For example, Nextel has launched a full-scale wireless broadband service in North Carolina's Research Triangle, and recently announced expansion of the service to a coverage area that is now approximately 1,300 square miles and extends to Raleigh, Durham, Chapel Hill, and other neighboring communities.[33] This service utilizes Flarion Technologies' Fast Low-latency Access with Seamless Handoff ("FLASH") Orthogonal Frequency Division Multiplexing ("OFDM") technology, a spread-spectrum-based technology that supports secure Internet access, broadband speed, and cellular mobility, and that Flarion describes as "the first fully mobile, OFDM airlink for wide area broadband networks."[34] The service offers downloads at 1.5 Mbps, bursting to 3 Mbps, with upload speeds of around 375 kbps, bursting to 750 kbps.[35]

Competition in the wireless industry is likely to spur further high-speed deployments. Sprint currently offers its 3G wireless technology, 1xRTT, on a nationwide basis.[36] While it is limited to 60 kbps, Sprint is expected to upgrade its service to an Evolution Data and Voice

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31 *See id.*; Walter S. Mossberg, *Verizon Is Crossing the U.S. with Speedy, True Wireless Access*, Wall St. J., Apr. 8, 2004.

32 *See* Mossberg, *supra* note 31. "Mbps" stands for millions of bits per second.

33 *See* Press Release, Nextel Communications Inc., N*extel Expands Successful Broadband Trial to Include Paying Customers and Larger Coverage Area* (Apr. 14, 2004), *available at* http://phx.corporate-ir.net/phoenix.zhtml?c=63347&p=irol-newsArticle&t=Regular&id=514459&.

34 Flarion Technologies, Inc., Products + Technology, *FLASH-OFDM Technology*, *at* http://www.flarion.com/products/flash_ofdm.asp (last visited May 5, 2004).

35 *See* Nextel Communications Inc., *supra* note 33.

36 1xRTT is a 3G wireless technology based on the Code Division Multiple Access ("CDMA") platform. The 1x in 1xRTT refers to 1x the number of 1.25 MHz channels. The RTT in 1xRTT stands for Radio Transmission Technology.

("EV-DV") network in the coming year, with estimated speeds greater than 1 Mbps.[37] AT&T Wireless also committed to upgrading the speed of its combination General Packet Radio Service/Enhanced Data rates for Global Evolution ("GPRS/EDGE") network by deploying a Universal Mobile Telephony System ("UMTS") in four major metropolitan markets later this year.[38] UMTS is expected to deliver speeds in the 384 kbps range.[39]

C. Unlicensed Services

1. Wi-Fi and Wi-Max

In recent years, the increasing availability and ease-of-use of Wi-Fi -- coupled with ever-diminishing prices -- have made it an ideal solution for many home networking applications. In addition, the widespread deployment of Wi-Fi technologies throughout businesses and communities has facilitated consumer access to broadband services in libraries, airports, hotels, coffee shops, campuses, and many other locations. Wi-Fi's range is limited to a few hundred feet, so Wi-Fi does not so much substitute for other last-mile broadband networks as it *extends* them. Still, Wi-Fi has undeniably increased access to broadband services for some Americans and increased the value of broadband services for many more.[40]

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37 *See* Dan Meyer, *Verizon Offers DO Details, Sprint Holds Out for DV, Cingular Pledges More EDGE*, RCR Wireless News, Mar. 29, 2004.

38 *See* Press Release, AT&T Wireless Services, Inc., *AT&T Wireless Forges Ahead with UMTS Network* (Mar. 22, 2004); *available at* http://www.attwireless.com/press/releases/2004_releases/032204.jhtml.

39 *See* AT&T Wireless Services, Inc., *3G Technology Center*, *at* http://www.attwireless.com/3G/TechnologyCenter/network/speeds_speeds.htm (last visited May 5, 2004).

40 Ultrawideband is another solution for similar applications, with data transfer rates of up to 480 Mbps but distances limited to about 10 meters. *See* Richard Shim, *Ultrawideband Groups Band Together*, CNET News.com, Apr. 16, 2004, *at* http://news.com.com/2100-7351_3-5193541.html?part=rss&tag=feed&subj=news.

For greater distances, Wi-Max offers a promising alternative.[41] Wi-Max networks are expected to have a range of about 30 miles, with data transfer speeds of up to 70 Mbps.[42] Intel, in particular, has embraced Wi-Max, announcing plans to include the technology in its future notebook chip sets.[43] Intel, Alcatel, and others are working to develop a version of Wi-Max that will offer broadband to mobile users as well.[44] Mobile-Fi, expected in 2-3 years, "will let people surf the Net at speeds even faster than their home broadband links today -- while they're racing along on a train or in a car."[45]

2. Broadband over Power Lines

Another potential mechanism for delivering broadband services is over power lines. Broadband over power lines ("BPL") uses an advanced form of carrier current systems to deliver high-speed services over the same wires that currently deliver electricity to the home. Commercial offerings of BPL have begun in Manassas, Virginia, Allentown, Pennsylvania, and Cincinnati, Ohio, and "electric companies from North Carolina to Hawaii are testing the service or plan to begin a pilot project."[46] The Commission is working to liberalize Part 15 rules to

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41 Wi-Max stands for Worldwide Interoperability for Microwave Access.

42 *See* Richard Shim, *Report: WiMax To Lead Broadband Wireless Market*, CNET News.com, Apr. 21, 2004, *at* http://news.com.com/2102-1035_3-5196795.html?tag=st.util.print.

43 *See* Jason Brooks, *Make Room for Wireless Broadband*, eWEEK.com, Apr. 26, 2004, *at* http://www.eweek.com/article2/0,1759,1572318,00.asp.

44 *See* Heather Green, *No Wires, No Rules*, BusinessWeek Online, Apr. 26, 2004.

45 *Id.*

46 William Glanz, *Electric Companies Begin Offering Broadband Service*, Wash. Times, Apr. 5, 2004.

facilitate BPL operations (while still preventing harmful interference to authorized radio communications and, hopefully, to cable transmission lines).[47]

D. Satellite

DBS companies also provide satellite-based Internet access services,[48] and a new generation of satellites, operating in the Ka-band, will soon permit them to deliver broadband services at greater speeds and lower cost.[49] Hughes Network Systems expects to launch its first Ka-band satellite this year, and plans to have its Spaceway platform fully operational by 2005.[50] The Spaceway service will provide customers with flexible bandwidth at download speeds of up to 50 Mbps and upload speeds of up to 16 Mbps.[51]

WildBlue Communications is scheduled to begin offering retail service in the second half of 2004 and is expected to launch its own satellite in early 2005.[52] WildBlue states that its service will provide customers with download speeds of up to 1.5 Mbps and upload speeds of up

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47 *See generally In re Carrier Current Systems, Including Broadband Over Power Line Systems and Amendment of Part 15 Regarding New Requirements and Measurement Guidelines for Access Broadband Power Line Systems*, Notice of Proposed Rulemaking, 19 FCC Rcd. 3335 (2004). One interesting feature of the technology described in the Notice is the ability to "notch out" frequencies from the BPL operation that might otherwise generate harmful interference. *See id.* ¶ 41.

48 *See generally In re Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming*, Tenth Annual Report, 19 FCC Rcd. 1606, ¶ 75 (2004).

49 Jim Hu, *Satellite Seeks Broadband Re-entry*, CNET News.com, Mar. 11, 2004, *available at* http://news.com.com/2102-1034_3-5172088.html?tag=st.util.print.

50 *See Big Plans for DirecTV 2004; Hughes Reports 4Q,* SKYREPORT.com, Feb. 11, 2004, *available at I* http://www.skyreport.com/viewskyreport.cfm?ReleaseID=1315#Story1; Peter B. DeSelding, *Spaceway Launch Date Moved to 2nd Quarter of 2004,* SPACENEWS.com, Nov. 11, 2003, *available at* http://dev.space.com/spacenews/launchindustry/spaceway_111103.html.

51 *See* Hughes Network Systems, SPACEWAY, *Mesh Point-to-Point Via Satellite Broadband — the Best of Both Worlds*, *at* http://www.hns.com/default.asp?CurrentPath=spaceway/benefits.htm (last visited May 5, 2004).

52 *See* WildBlue Communications, *WildBlue Corporate Backgrounder*, *at* http://www.WildBlue.com /about/backgrounder.asp (last visited Apr. 30, 2004); *see also* Press Release, Arianespace, *WildBlue Communications Chooses Arianespace* (Feb. 15, 2003), *available at* http://www.arianespace.com/ site/news/04_4_30_release_index.html.

to 256 kbps.[53] Also, in 2003, EchoStar launched its EchoStar IX satellite, which carries the first commercial Ka-band spot-beam payload designed for use over the United States. EchoStar states that the satellite will be used to provide broadband services in the future.[54]

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Clearly, there is investment and innovation occurring across a range of platforms. All of the lanes of the Information Superhighway -- telephone, cable, wireless, satellite, and unlicensed -- are delivering, or at least beginning to deliver, broadband services. Inevitably, not all of these initiatives will succeed; experience teaches that some technologies will not work as well as expected, and some business plans will be flawed in design or execution.[55] But the sheer number and variety of differing approaches that are currently being implemented, or are now attracting investment, ensure that facilities-based high-speed services will continue to develop, that deployment will expand to additional homes, and that the number of consumers with access to competitive choices between or among high-speed service providers will continue to grow.

III. MARKET FORCES MUST DETERMINE THE NATURE AND PACE OF BROADBAND DEPLOYMENT.

Given the rapid deployment of broadband technologies over the past several years, the intense competition that already exists in many areas, and the additional investment, innovation, and implementations that are underway, a declaration that deployment is occurring "in a reasonable and timely manner" would be a gross understatement. The fact is, broadband supply

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53 *See* WildBlue Communications, *Service Overview*, *at* http://www.wildblue.com/services/ (last visited Apr. 30, 2004).

54 *See* Press Release, EchoStar Communications Corp., *EchoStar IX Satellite Scheduled to Launch Aug. 7; New Satellite to Provide First Ever Ka-band Commercial Service* (Aug. 4, 2003), *available at* http://www.corporate-ir.net/ireye/ir_site.zhtml?ticker=dish&script=410&layout=-6&item_id=438132.

55 *See* Jeff Smith, *Internet Access from the Sky Has Yet to Fly*, Rocky Mtn. News, Apr. 26, 2004.

and broadband demand are growing beyond any measure of what could have been foreseen at the time the Telecommunications Act was enacted. A service that was nonexistent in 1996 is now available in one form or another throughout the country, and "[h]ouseholds are adopting high-speed Internet access as rapidly as they have adopted any [communications] service in the recent past."[56]

Government played a major role in bringing about this state of affairs. Acting pursuant to direction from Congress, the Commission allocated spectrum for PCS and gave PCS providers flexibility in choosing the technologies and services they would provide. The Commission initiated the Part 15 changes that have enabled Wi-Fi, Wi-Max, and broadband over power lines. In these and other ways, Congress and the Commission have helped to promote the innovation that is so clearly benefiting consumers.

In a number of critical respects, the government's most essential contribution to the process has been through regulatory restraint. The 1996 Act was most notable for establishing deregulation and competition as the guiding precepts for communications policy.[57] Congress implemented those principles in part by eliminating the rate regulation that had impeded the cable industry's access to the capital markets, and it thereby restored the cable industry's ability to borrow and spend the tens of billions of dollars needed to convert a uni-directional, analog,

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[56] Congressional Budget Office, *Does the Residential Broadband Market Need Fixing?* 6 (Dec. 2003), *available at* http://www.cbo.gov/showdoc.cfm?index=4868&sequence=0. "For example, cellular telephone service, now available in most regions of the country, took six years to reach 7.5 million subscribers, a feat that the residential broadband market achieved in 3.5 years." *Id.*

[57] The Preamble declares Congress's intent "to promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies." Telecommunications Act of 1996, preamble, 110 Stat. at 56. Congress also established a national policy of "preserv[ing] the vibrant and competitive free market that presently exists for the Internet and other interactive computer services, unfettered by Federal or State regulation." 47 U.S.C. § 230(b)(2).

single-service facility into a bi-directional, digital, multiple-service facility, and to increase bandwidth -- over $85 billion to date.[58]

The Commission has followed Congressional guidance. By rejecting calls to impose common carrier requirements on high-speed cable Internet service, and by finding it instead to be an interstate information service, the Commission allowed cable operators to focus on investing in competitive facilities and delivering the services that consumers want.[59] This same ruling also provided reassurance to wireless, satellite, and other providers that they, too, can pursue broadband investments without being saddled with unnecessary government regulation.

In short, the broadband marketplace is succeeding in large part because Congress and the Commission have both taken the steps necessary to remove barriers to competition, while simultaneously striving to minimize regulation.[60] And, precisely as Congress intended, the growing competition in this marketplace has eliminated any arguable justification for regulation. Comcast wholeheartedly agrees with Chairman Powell's assertion that, for service providers, delivering what consumers want is "good business" and that competition and self-interest

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58 *See* Nat'l Cable & Telecomm. Ass'n, Industry Overview, Statistics & Resources, *Infrastructure Expenditures*, *at* http://www.ncta.com/Docs/PageContent.cfm?pageID=314 (last visited May 6, 2004).

59 *See In re Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities; Internet Over Cable Declaratory Ruling; Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities*, Declaratory Ruling and Notice of Proposed Rulemaking, 17 FCC Rcd. 4798 (2002), *aff'd in part*, *vacated in part*, *Brand X Internet Serv. v. FCC*, 345 F.3d 1120 (9th Cir. 2003); s*ee also Brand X Internet v. FCC*, No. 02-70518 (9th Cir. Apr. 9, 2004) (granting motions by FCC and NCTA for stay of the mandate until June 30, 2004 or until the Supreme Court rules on any petitions for writ of certiorari).

60 By contrast, in the areas facing the greatest regulation, rules intended to promote local telephone competition and the "transition" to facilities-based competition remain in dispute, numerous issues relating to the collection and distribution of universal service funding for high-cost and low-income consumers remain undecided, and intercarrier compensation anomalies still need to be fixed -- eight years after enactment of the Telecommunications Act.

generally will cause service providers to empower consumers to access and use the content, applications, and devices of their choice.[61]

Thus, any proposals for additional government actions relating to broadband services should be carefully evaluated to determine if they promote the pro-competitive and deregulatory goals Congress has established. Certain proposals (*e.g.*, competitively and technologically neutral proposals for financial assistance to broadband providers who expand into unserved areas and efforts to ease access to public rights-of-way) may well advance these goals. Others clearly do not.[62]

The proper role of government -- and the path of proven success -- is to continue to eliminate barriers to investment and innovation in broadband services. Finding additional spectrum that may be used for wireless broadband services is a perfect example. In this regard, the Commission recently held an auction to award licenses for Multipoint Video and Data Distribution Service ("MVDDS"),[63] and the Commission recently proposed to permit unlicensed (or possibly a combination of licensed and unlicensed) operation in the 3650-3700 MHz band with the goal of fostering the introduction of new and advanced services to the American public, especially in rural areas.[64] An additional constructive step that should be considered is to

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61 Michael K. Powell, Chairman, FCC, *Preserving Internet Freedom: Guiding Principles for the Industry*, Remarks at the Silicon Flatirons Symposium on "The Digital Broadband Migration: Toward a Regulatory Regime for the Internet Age," University of Colorado Law School 3 (Feb. 8, 2004) (as prepared for delivery).

62 One proposal that is wildly off the mark would be to establish an industrial policy whereby government would dictate a transmission speed that is appropriate for every household, dictate a preferred transmission medium to deliver that speed ubiquitously to homes across the Nation, and then establish a multi-billion-dollar subsidy scheme to promote universal subscription to broadband services.

63 *See* Public Notice, *Multichannel Video Distribution and Data Service Spectrum Auction Closes, Winning Bidders Announced*, DA 04-215 (Feb. 2, 2004).

64 *See In re Unlicensed Operation in the Band 3650 - 3700 MHz,* Notice of Proposed Rulemaking, ET Docket No. 04-151, FCC No. 04-100 (rel. Apr. 23, 2004).

eliminate eligibility requirements for MMDS, LMDS, and MVDDS spectrum. The Commission has been too quick to assume that cable and telephone companies should be precluded from making productive use of these bands, and as a result MMDS and LMDS frequencies, at least, are currently underutilized. If others could use these and other wireless technologies to expand broadband, it makes no sense to impose eligibility restrictions.

Government could also do more to break down barriers that hinder broadband providers from accessing public rights-of-way. President Bush recently took the important step of directing the heads of executive departments and agencies to implement changes in federal policies, procedures, regulations, and practices so as to streamline the process for granting rights-of-way for broadband communications networks on lands under federal jurisdiction.[65] Greater efforts are also needed to secure access for broadband networks to other rights-of-way,[66] and to prevent state and local governments from using their right-of-way management authority as a basis for imposing excessive fees or taxes or as a justification for seeking to regulate the technical characteristics (*e.g.*, transmission speeds, service quality), pricing, provisioning, or billing for broadband services.[67]

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65 *See* George W. Bush, *Broadband Rights-of-Way Memorandum* (Apr. 26, 2004), *available at* http://www.whitehouse.gov/news/releases/2004/04/20040426-2.html; *see also* Federal Rights-of-Way Working Group, NTIA, *Improving Rights-of-Way Management Across Federal Lands: A Roadmap for Greater Broadband Deployment* (Apr. 2004), *available at* http://www.ntia.doc.gov/reports/fedrow/FROWReport_4-23-2004.pdf.

66 A study committee on public rights-of-way established by the National Association of Regulatory Utility Commissioners has compiled a detailed report on the subject. *See* NARUC, *Promoting Broadband Access Through Public Rights-of-Way and Public Lands* (July 31, 2002), *available at* http://www.naruc.org. The report recognizes that, "[i]n many instances, right-of-way access is not as available as it should be. Parochial concerns sometimes slow, and occasionally halt, competition in communications services and the accelerated deployment of new technologies. Recent enactments suggest that state legislatures can alter right-of-way access issues for the better." *Id*. at 3.

67 The addition of high-speed Internet capabilities to the cable plant does not increase the burden placed on public rights-of-way (or telephone poles). Accordingly, proper administration of rights-of-way (or telephone poles) should not contemplate additional fees or obligations upon the service provider.

IV. CONCLUSION

The broadband marketplace is currently vibrant, dynamic, competitive, and growing. There has been no greater success in any communications market over the past decade than the emergence, rapid deployment, and enormous consumer demand for high-speed Internet from competing facilities-based providers. Much of the success of this marketplace is due to Congress's and the Commission's conscious and commendable decision to minimize governmental interference with market forces; there is simply no credible argument that comparable progress could have been made had the evolution of these services been governed by command-and-control regulation. Accordingly, and for all the reasons stated above, Comcast urges the Commission to recognize that "advanced telecommunications capability" is in fact being deployed to all Americans in a reasonable and timely manner and to otherwise continue its procompetitive and deregulatory stance toward broadband services.

Respectfully submitted,

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APPENDIX

ADVANCED TELECOMMUNICATIONS CAPABILITY SUCCESS STORIES

I. HIGH-SPEED BROADBAND EDUCATIONAL INITIATIVES

Comcast and the cable industry have a long-standing commitment to promoting adoption of high-speed broadband technologies in all aspects of everyday life. In addition to providing broadband technologies to residential customers through high-speed cable Internet service, the cable industry, at its own expense, has pursued unique initiatives to make available and promote the use of broadband technologies for educational purposes by teachers, students, and parents. Four of these educational initiatives are particularly noteworthy: Cable in the Classroom, Comcast's high-speed education connections for schools, Comcast's work to provide teachers free professional development in education technology, and Comcast's after-school and community center broadband programs.

Cable in the Classroom. Created in 1989, Cable in the Classroom is one of the cable industry's most successful commitments to education. Indeed, Cable in the Classroom represents the only industry-wide commitment to education among media, telecommunications, and technology industries. Through Cable in the Classroom, the cable industry has created and distributed innovative educational content to teachers and students nationwide. Over the past fifteen years, Comcast and other cable companies have wired schools and provided free access to commercial-free, educational video programming. Cable in the Classroom has empowered educators to use a combination of cutting-edge media technologies and broadband connectivity to support teaching and learning in communities throughout the United States, and to maximize the video programming and online resources available to them.

Through the participation of 8,500 local cable operators and their local public and private schools, dynamic video and online content is delivered via cable technology to more than 81,000 schools (or 78% of K-12 public and private schools) in the United States and 86% of all K-12 students. In addition, 39 national cable networks including CNN, The History Channel, and Discovery Networks provide educationally rich and commercial-free programming and online resources, covering all disciplines and issues, for teachers to use in their classroom.

Cable in the Classroom's collaborative efforts with prominent education advisors and educators have produced exceptional educational content, as well as online and print materials that assist teachers in using that content to illustrate concepts and spark classroom discussion. These resources include: (1) a list of educational programming available on a daily basis, http://www.ciconline.org; (2) online professional enrichment resources for teachers such as *Learning with Technology*, http://www.ciconline.org/Enrichment/Teaching/learningwithtechnology, *Reflections on Teaching*, http://www.ciconline.org/Enrichment/Teaching/Reflections, and *Expert Advice*, http://www.ciconline.org/Enrichment/Teaching/expertadvice; and (3) online educational materials that assist parents and educators in ensuring that they and the children they teach are media literate, including educating parents about how to utilize the technology available from cable operators to manage their children's access to content they deem inappropriate, http://www.ciconline.org/Enrichment/MediaLiteracy.

Comcast's High-Speed Education Connections. Comcast has taken the lead in making broadband technologies available to teachers, students, and parents, and promoting the use of those technologies for educational purposes. Comcast has provided free high-speed Internet connections to over 1,200 schools throughout its service areas. For example, since 1998, across Maryland and the Washington, DC metropolitan area, Comcast has connected more than 300 schools to the Internet. In Washington, Comcast established its first High Speed Learning Zone in March 2002 at Ketcham Elementary School to celebrate Anacostia becoming the first neighborhood in Washington to enjoy the benefits of a fully upgraded cable broadband network. Just last week, on May 6, 2004, Comcast announced that it will wire and provide free broadband service to an additional eighteen Baltimore City schools. Moreover, Comcast extended this offer to any school in the city where Internet service is needed and has lined up twenty-two more schools for wiring and service.

Comcast's Teachers Professional Development Programs. Comcast understands that, once teachers and students have broadband tools available, they need to be able to use them effectively. As a result, Comcast initiated two successful programs to provide Internet training to teachers as free, professional development opportunities to help integrate technology in the classroom. Following its launch in January 2001, the Comcast Technology Academy provided free technology training to over 4,100 K-12 teachers. The introduction of this program was greeted with an overwhelming response as over 1000 teachers registered for the scheduled workshops within the first month. More recently, Comcast and Cable in the Classroom collaborated to develop a new approach to professional development for K-12 teachers; an approach that blends online and face-to-face learning. The program allows teachers to take online professional development courses offered by WIDE World at the Harvard Graduate School of Education, and to participate in complementary face-to-face sessions developed and facilitated by teachers certified by the National Board of Professional Teaching Standards. The pilot for the program was launched in public schools in the District of Columbia and six counties in the Washington, DC metropolitan area.

Comcast's After-School and Community Center Programs. Comcast, through the Comcast Community Connection program, is working to bring access to broadband technologies into after-school programs and community centers in neighborhoods where in-home computer penetration is below 40%. As part of this program, the Comcast Technology Labs in The Honickman Learning Center partnered with Project H.O.M.E., a not-for-profit neighborhood revitalization organization located in a North Central Philadelphia community center. Comcast also has a long history of supporting the Police Athletic League of Philadelphia ("PAL"), an organization offering athletic, recreational, and educational activities to more than 27,000 boys and girls throughout Philadelphia. Comcast has for the past eight years provided high-speed broadband Internet connectivity free of charge to eleven PAL centers. Last year Comcast expanded its partnership with PAL to include a 12-week course that teaches basic and intermediate computer skills including word processing, web design, and Internet safety.

II. STUDENTS & LEADERS IN WASHINGTON, DC AND NEW YORK

Washington, DC Project. In May 2003, C-SPAN and Comcast joined forces to provide a unique educational experience for students across the United States. In twenty days, C-SPAN and Comcast's *Students & Leaders* series brought forty national leaders from all walks of life "back to the classroom" in forty DC-area schools to discuss their lives, insights on leadership, and motivations for choosing careers in public service. Participating leaders included Supreme Court Justices Sandra Day O'Connor, Clarence Thomas, and Stephen Breyer; Congressmen John Lewis and Tom Davis; Executive Branch cabinet members and officials such as Secretary of Education Rod Paige and FBI Director Robert Mueller; as well as Virginia Governor Mark Warner and major national media figures such as William Raspberry. Each event was filmed by C-SPAN cameras and aired on C-SPAN 3 and re-aired on C-SPAN and C-SPAN2 on cable systems throughout the country. In addition, *Students & Leaders* made streamed video of the events available for viewing on its website along with lesson plans and additional information about the speakers and events. At the end of the project, thirteen scholarships totaling $25,000 were awarded to students who eloquently described how the events impacted their lives.

Students & Leaders surpassed its goals in nearly every way. The project and its organizers, Comcast and C-SPAN, received high praises from students, teachers, principals, and national leaders. *Students & Leaders* provided an extraordinarily powerful educational tool as students heard first-hand about leaders' experiences, for example, from Congressman John Lewis about his involvement with the Freedom Rides and his work with Dr. Martin Luther King, Jr. and from Supreme Court Justice Clarence Thomas about his accomplishments and advice on how to attain individual goals. The resources created by the project, including the website materials and opportunities for repeat viewing, continue to provide valuable tools for teaching and learning in schools and homes. As of May 2004, thousands of Internet users have visited the *Students & Leaders* website, and a large portion of users have accessed the video streaming files. If C-SPAN's success with its other series -- such as the 1999 American Presidents series, http://www.americanpresidents.org/, which has experienced an ever-increasing number of video streaming downloads -- is any indication, *Students and Leaders* will provide students, teachers, and parents a unique educational experience via their broadband networks for years to come. For instance, C-SPAN experienced a growth rate of 219% in calendar year 2003 for the number of broadband video streams viewed on its website. Based on the powerful impact of *Students and Leaders* as an educational tool, Comcast and C-SPAN were honored in March 2004 with a Golden Beacon Award for outstanding public affairs programming.

New York Project. In light of the initial success of *Students & Leaders*, a similar project will return in 2004. Between May 17th and May 21st, 2004, C-SPAN and Time Warner Cable will present the New York *Students & Leaders* Project. The New York *Students & Leaders* will bring ten national leaders to five different schools and air the events on C-SPAN and C-SPAN 2, as well as make video copies of the events and lesson plans available on the Internet. Guest speakers will include Congressman Vito Fossella, Broadway Director and Producer Harold Prince, Author Frank McCourt, and CNN Senior Analyst Jeff Greenfield.

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Through these efforts, Comcast and the cable industry have introduced and continue to introduce an ever-increasing number of students, teachers, and parents to broadband technologies. By connecting thousands of schools to receive educational video programming and high-speed cable Internet service, by creating and producing educational video programming and online content, and by providing training for teachers on how to use those resources to maximize the classroom experience, Comcast and the cable industry are ensuring that future American workers have the skills to use broadband services at work and at home. These efforts also help expand the reach of broadband technologies to all Americans.